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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/763,411	04/02/2001	Naohito Hanai	108692	5073

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EXAMINER	
SANTIAGO, ENRIQUE L	
ART UNIT	**PAPER NUMBER**
2628	

DATE MAILED: 03/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/763,411	Applicant(s) HANAI ET AL.	
	Examiner Enrique L. Santiago	Art Unit 2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments submitted on February 24, 2006 with respect to the rejection of the claims in view of Hayashi et al. US patent no. 6,634,948 B1 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Kitaue, US patent no. 5,150,899.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 15-18, 20-23, 26, 29-32, 34-37 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colwell US patent no. 5,877,777 in view of Gagne et al. US patent no. 5,731,819 in view of Isowaki et al. US patent no. 6,417,854 and further in view of Kitaue et al. US patent no. 5,150,899.

-Regarding claims 15 and 29, Colwell teaches a computer-usable program embodied on an information storage medium or in a carrier wave, in which is stored information for controlling an image generation system which generates an image of an object formed by a primitive surface (see figs. 1, 6 and 14, column 3, lines 8-38, column 4, lines 13-28, column 9, lines 56-67, column 10, lines 22-28): impact computation means which computes an impact position at which an impact is imparted to the object hit in real time (see fig. 12, column 3, lines 30-44, column 4, lines 8-10); distortion computation means which performs computations for

causing the distortion of the primitive surface in a vicinity of the impact position (see figs. 12 and 14, column 11, lines 22-32); and image generation means which generates an image of the object formed by the primitive surface that has been distorted after the impact was imparted to the object (see figs. 1, 6 and 14, column 11, lines 22-32).

Although Colwell teaches the effect of an object impacting a surface and the wire-frame response, it does not specifically teach point-to-be-moved determination means which determine at least one surface-specifying point that is to be moved, based on the impact position, from among surface-specifying points that are distributed over the surface of the object or in a vicinity of the object for defining the primitive surface that forms the object.

However in similar art Gagne et al. teaches said means (see column 6, lines 23-28). Therefore it would have been obvious to one skilled in the art at the time of the invention to use said means in combination with Colwell, because it would make the reaction and appearance of one or more objects after being hit more realistic (see Colwell, column 4, lines 1-12).

Colwell and Gagne et al. do not directly teach a point to be moved after an object has been subjected to an initial impact, but no subsequent impacts.

However in similar art Isowaki et al. teaches said system (see figs. 18-20, column 3, lines 1-10, column 12, lines 48-59, column 13, lines 10-26). Therefore it would have been obvious to one skilled in the art at the time of the invention to use said means in combination with Colwell and Gagne et al., because it would make the reaction and appearance of one or more objects after being hit more realistic (see Colwell, column 4, lines 1-12).

Colwell, Gagne et al. and Isowaki et al. do not directly teach hit check-processing means for determining whether and object has been hit by a player using a controller. However in

similar art Kitaue et al. teaches said means (see fig. 4C, column 7, lines 36-43). Therefore it would have been obvious to one skilled in the art at the time of the invention to use said method in combination with Colwell, Gagne et al. and Isowaki et al., because it could be applied to real-time virtual reality, e.g. 3D games, as well as to the more sophisticated special effects development, fields of endeavor (see Colwell, column 4, lines 8-12).

-Regarding claims 16 and 30, Gagne et al. further teaches: means which compute at least one distortion point for specifying the shape of the primitive surface that is distorted by an impact (see figs. 3 and 4, column 6, lines 23-28); and means which causes the position of the thus-determined surface-specifying point to move to the distortion point (see figs. 3 and 4, column 6, lines 23-28); and wherein the image generation means specifies the primitive surface based on the surface-specifying point that has been moved and generates an image (see figs. 3 and 4, column 5, lines 47-49, column 6, lines 23-28). Therefore it would have been obvious to one skilled in the art at the time of the invention to use said means in combination with Colwell, because it would make the reaction and appearance of one or more objects after being hit more realistic (see Colwell, column 4, lines 1-12).

-Regarding claims 17 and 31, Colwell further teaches an image generation system wherein the impact computation means further comprises means which calculates the magnitude and direction of the impact imparted to the object (see fig. 12, column 10, lines 11-50); and wherein the distortion point is calculated from at least one of the impact position and the magnitude and direction of the impact (see fig. 12, column 10, lines 11-50.

-Regarding claims 18 and 32, Colwell further teaches an image generation system wherein the wire-frame mesh defining a two-dimensional regular array of adjacent volumetric

fluid cells are distributed in a predetermined density (see column 9, lines 10-11, column 10, lines 4-7), which is equivalent to the surface-specifying points being distributed in a predetermined density.

-Regarding claims 20 and 34, Colwell teaches a computer-usable program embodied on an information storage medium or in a carrier wave, in which is stored information for controlling an image generation system which generates an image of an object formed by a primitive surface (see figs. 1, 6 and 14, column 3, lines 8-38, column 4, lines 13-28, column 9, lines 56-67, column 10, lines 22-28), the program further comprising information necessary for implementing impact computation means which computes an impact position at which an impact is imparted to the object hit in real-time (see fig. 12, column 3, lines 30-44, column 4, lines 8-10); distortion computation means which performs computations for causing distortion of the primitive surface in a vicinity of the impact position (see figs. 12 and 14, column 11, lines 22-32); image generation means which generates an image of the object formed by the primitive surface that has been distorted after the impact was imparted to the object (see figs. 1, 6 and 14, column 11, lines 22-32): and adjusting means which adjusts the density of distribution of the surface-specifying points in accordance with a magnitude of distortion of the object due to an impact (see column 4, lines 13-28, column 9, lines 10-15), and the magnitude of distortion due to the impact is determined by at least one of a material of the object subjected to the impact and a type of the impact (see fig. 12, column 9, lines 5-18).

Although Colwell teaches the effect of an object impacting a surface and the wire-frame response, it does not specifically teach point-to-be-moved determination means which determine at least one surface-specifying point that is to be moved, based on the impact position, from

among surface-specifying points that are distributed over the surface of the object or in a vicinity of the object for defining the primitive surface that forms the object.

However in similar art Gagne et al. teaches said means (see column 6, lines 23-28). Therefore it would have been obvious to one skilled in the art at the time of the invention to use said means in combination with Colwell, because it would make the reaction and appearance of one or more objects after being hit more realistic (see Colwell, column 4, lines 1-12).

Colwell and Gagne et al. do not directly teach a point to be moved after an object has been subjected to an initial impact, but no subsequent impacts.

However in similar art Isowaki et al. teaches said system (see figs. 18-20, column 3, lines 1-10, column 12, lines 48-59, column 13, lines 10-26). Therefore it would have been obvious to one skilled in the art at the time of the invention to use said means in combination with Colwell and Gagne et al., because it would make the reaction and appearance of one or more objects after being hit more realistic (see Colwell, column 4, lines 1-12).

Colwell, Gagne et al. and Isowaki et al. do not directly teach hit check processing means for determining whether and object has been hit by a player using a controller. However in similar art Kitaue et al. teaches said means (see fig. 4C, column 7, lines 36-43). Therefore it would have been obvious to one skilled in the art at the time of the invention to use said method in combination with Colwell and Gagne et al., because it could be applied to real-time virtual reality, e.g. 3D games, as well as to the more sophisticated special effects development fields of endeavor (see Colwell, column 4, lines 8-12).

-Regarding claims 21 and 35, Gagne et al. further teaches an image generation system wherein the point-to-be-moved determination means determines a surface-specifying point in the vicinity of the impact position as a point to be moved (see column 6, lines 23-28).

-Regarding claims 22 and 36, Gagne et al. further teaches an image generation system wherein the surface-specifying points are distributed in real-time after the object has been subjected to an impact (see column 6, lines 35-39 and 57-62).

-Regarding claims 23 and 37, Gagne et al. further teaches an image generation system at least one of the range and density of distribution of the surface-specifying points is determined in accordance with an impact that has been imparted to the object (see column 6, lines 23-40).

-Regarding claims 26 and 40, Colwell and Gagne et al. do not directly teach an image generation system wherein image generation is performed for an object formed by polygonal surfaces having the surface-specifying points as vertices. However in similar art Isowaki et al. teaches said system (see column 12, lines 48-59). Therefore it would have been obvious to one skilled in the art at the time of the invention to use said method in combination with Colwell and Gagne et al., because it could be applied to real-time virtual reality, e.g. 3D games, as well as to the more sophisticated special effects development fields of endeavor (see Colwell, column 4, lines 8-12).

Claims 19 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colwell US patent no. 5,877,777 in view of Gagne et al. US patent no. 5,731,819 in view of Kitaue et al. US patent no. 5,150,899, and further in view of Deering et al., US patent no. 6,417,861 B1.

-Regarding claims 19 and 33, Colwell, Gagne et al., and Kitaue et al. do not directly teach an image generation system wherein the surface-specifying points are distributed in an

arrangement that deviates in a random manner from grid points. However in similar art Deering et al. teaches said system (see column 6, lines 14-16, column 17, lines 6-52).

Therefore it would have been obvious to one skilled in the art at the time of the invention to use said system in combination with Colwell, Gagne et al., and Kitaue et al., because it would make the reaction and appearance of one or more objects after being hit more realistic (see Colwell, column 4, lines 1-12).

Claims 24, 25, 27, 38, 39 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Colwell US patent no. 5,877,777 in view of Gagne et al. US patent no. 5,731,819 in view of Kitaue et al. US patent no. 5,150,899, and further in view of Isowaki et al. US patent no. 6,417,854.

-Regarding claims 24 and 38, Colwell, Gagne et al. and Kitaue et al. do not directly teach an image generation system comprising texture mapping computation means which performs computations necessary for mapping a texture onto the primitive surface that has been distorted by an impact; wherein the texture mapping computation means performs texture mapping processing, using texture coordinates that corresponded to the surface-specifying point before movement, even when the surface-specifying point has been moved by an impact.

However in similar art Isowaki et al. teaches said system (see column 3, lines 1-10, column 12, lines 60-65, column 14, lines 61-67). Therefore it would have been obvious to one skilled in the art at the time of the invention to use said means in combination with Colwell, Gagne et al. and Kitaue et al., because it would make the reaction and appearance of one or more objects after being hit more realistic (see column 4, lines 1-12).

-Regarding claims 25 and 39, Colwell, Gagne et al. and Kitaue et al. do not directly teach an image generation system comprising texture mapping computation means which performs computations necessary for mapping a texture onto the primitive surface that has been distorted by an impact; wherein the texture mapping computation means comprises means which performs texture mapping processing, using texture coordinates which correspond to the impact position and are related to the surface-specifying point that has been moved by an impact.

However in similar art Isowaki et al. teaches said system (see column 3, lines 1-10, column 12, lines 60-65, column 14, lines 61-67). Therefore it would have been obvious to one skilled in the art at the time of the invention to use said means in combination with Colwell, Gagne et al. and Kitaue et al., because it would make the reaction and appearance of one or more objects after being hit more realistic (see column 4, lines 1-12).

-Regarding claim 27 and 41, Isowaki et al teaches means which perform image generation by using a polygonal object having the surface-specifying points as vertices (see column 12, lines 54), and a shading process in the vicinity of the vertices after the vertices have been moved by an impact (see column 5, lines 1-17, column 14, lines 61-67). The previously stated art does not specifically teach shading in such a manner that the vicinity of the vertices after movement is darker.

However it teaches that texture mapping of ordinary undamaged texture and damaged texture is performed on the polygons, and controlling the transparency parameters of both textures in accordance with the state of damage to the impacted portion.

Hence it would have been obvious to one skilled in the art at the time the invention was made to shade in such a manner that the vicinity of the vertices after movement is darker (or

lighter), because it would make it possible to render damage in accordance with the damage of the impacted portion and therefore it would have been obvious to one skilled in the art at the time of the invention to use said means in combination with Colwell, Gagne et al. and Kitaue et al., because it would make the reaction and appearance of one or more objects after being hit more realistic (see column 4, lines 1-12).

Claims 28 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isowaki et al. US patent no. 6,417,854 in view of Colwell US patent no. 5,877,777 and further in view of Kitaue et al. US patent no. 5,150,899.

-Regarding claims 28 and 42, Isowaki et al. teaches an image generation system which generates an image of an object formed by a polygonal surface (see fig. 1, column 4, lines 14-19 and 56-61), the image generation system comprising: object information storage means which stores information on the object formed by the polygonal surface having vertices that are a plurality of points distributed after the object has been subjected to an initial impact, but no subsequent impacts, over the surface of the object (see figs. 18-20, column 3, lines 1-8, column 12, lines 48-59, column 13, lines 10-33); point-to-be-moved determination means that operates when an impact is imparted to the object, for determining at least one vertex to be moved, based on an imparted impact position (see figs. 22-24, column 13, line 35-column 14, line 67); means which causes the vertex to be moved to move, based on the magnitude and direction of the impact imparted to the object (see figs. 22-24, column 13, line 35-column 14, line 67); and image generation means which generates an image of the object after a distortion caused by the impact, using the vertex that has been moved (see column 13, line 35-column 14, line 67).

Isowaki et al. does not directly teach surface-specifying points being distributed in a predetermined density. However in similar art Colwell teaches an image generation system wherein the wire-frame mesh defining a two-dimensional regular array of adjacent volumetric fluid cells are distributed in a predetermined density (see column 9, lines 10-11, column 10, lines 4-7), which is equivalent to the surface-specifying points being distributed in a predetermined density.

Therefore it would have been obvious to one skilled in the art at the time of the invention to use said system in combination with Isowaki et al., because it would make it possible to render and display more realistic images (see column 1, lines 5-9).

Isowaki et al. and Colwell do not directly teach hit check-processing means for determining whether and object has been hit by a player using a controller. However in similar art Kitaue et al. teaches said means (see fig. 4C, column 7, lines 36-43). Therefore it would have been obvious to one skilled in the art at the time of the invention to use said means in combination with Isowaki et al. and Colwell, because it would make it possible to reproduce changes on an object due to impact even when the changes are minimal (see column 15, lines10-14), therefore making it possible to render and display more realistic images (see column 1, lines 5-9).

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 15, 16, 18-28 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

-Claims 15, 16, 18-28 are directed to "*a computer-usable program embodied on an information storage medium* <u>*or in a carrier wave*</u>", a signal (<u>*carrier wave*</u>) encoded with functional descriptive material is similar to a computer-readable memory encoded with functional descriptive material, in that they both create a functional interrelationship with a computer, however a claim reciting a signal encoded with functional descriptive material does not fall within any of the categories of patentable subject matter set forth in § 101, because signals are nonstatutory natural phenomena (See MPEP 2106).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Enrique L Santiago whose telephone number is (571) 272-7648. The examiner can normally be reached on Monday to Thursday from 6:30 A.M. to 4:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark K. Zimmerman whose telephone number is (571) 272-7653, can be reached on Monday to Friday from 7:00 A.M. to 3:30 P.M.

Any response to this action should be mailed to:

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Enrique L. Santiago

March 16, 2006

Mark Zimmerman

MARK ZIMMERMAN
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